WHAT IS CLAIMED IS:

1. A magnetic film comprising:

a magnetic alloy T-M-X wherein T is selected from the group consisting of at least about 90% Fe, Co, and Ni, M is selected from the group consisting of B, Al, Si, P, Ti, V, Cr, Cu, Ga, Ge, Zr, Nb, Mo, Ru, In, Sn, Hf, and Ta, and X is selected from the group consisting of N, O, and C; and

at least a single nanolamination of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf.

2. A magnetic film according to claim 1, wherein T is Fe and X is N.

3. A magnetic film according to claim 1, wherein the nanolamination has a thickness of approximately 0.4 to 1.7 A.

4. A film structure comprising:

at least a first substantially crystalline layer of the compound T-M-X wherein T is selected from the group consisting of Fe, Co, and Ni, M is selected from the group consisting of B, Al, Si, P, Ti, V, Cr, Cu, Ga, Ge, Zr, Nb, Mo, Ru, In, Sn, Hf, and Ta, and X is selected from the group consisting of N, O, and C;

nanolaminations of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf;

said nanolaminations being contained within said first layer; and

at least a second layer of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf;

said second layer being laminated adjacent to said first layer.

5. A film structure according to claim 4 wherein T is Fe and X is N.

6. A film structure according to claim 4 wherein each of the nanolaminations has an individual thickness of approximately 0.4 – 1.7 A.

7. A film structure comprising:

at least a first substantially crystalline layer of the compound Fe-M-O-N wherein M is selected from the group consisting of B, Al, Si, P, Ti, V, Cr, Cu, Ga, Ge, Zr, Nb, Mo, Ru, In, Sn, Hf, and Ta; said first layer contains nanolaminations of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf;

at least a second layer of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf; and

said second layer being laminated adjacent to said first layer.

8. A film structure according to claim 7, wherein the nanolaminations have a thickness of approximately 0.4 to 1.7 A.

9. A film structure for a GMR head comprising:

at least a single layer of a magnetic film for the GMR head including:

at least a first layer of a magnetic compound T-M-X wherein T is selected from the group consisting of Fe, Co, and Ni, M is selected from the group consisting of B, Al, Si, P, Ti, V, Cr, Cu, Ga, Ge, Zr, Nb, Mo, Ru, In, Sn, Hf, and Ta, and X is selected from the group consisting of N, O, and C; and

nanolaminations within said first layer of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf.

10. A GMR head according to claim 9 wherein multiple layers of the magnetic film are alternately laminated with significantly relatively thinner layers of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf.

11. A method of forming a film structure having at least a single layer magnetic film comprising a magnetic material and at least one nanolamination of a different material, the method comprising:

aligning a substrate with a first deposit target;

depositing a magnetic material from said first deposit target;

aligning the substrate with a second deposit target;

depositing a nanolamination from said second deposit target;

performing the depositions in an environment of a reactive gas; and

annealing the film structure at a temperature less than about 350°C.

12. A method according to claim 11 wherein the reactive gas is selected from the group consisting of $N_2$, $N_2O$, $O_2$, $CO_2$, $CH_4$ or $NH_3$.

13. A method according to claim 11 wherein said first deposit target is a Fe-Al target and said second deposit target is a $Al_2O_3$ target.

14. A method according to claim 13 wherein power in the range of about 100-400 W is applied to the $Al_2O_3$ target.

15. A method according to claim 11 wherein said substrate is alumina-TiC composite ceramic.

16. A method according to claim 15 wherein said composite ceramic is coated with sputtered amorphous alumina.

17. A method according to claim 11 wherein said laminated films are N doped.

18. A method according to claim 17 wherein a $N_2$/Ar gas mix is used as a process gas.

19. A method according to claim 11 wherein said laminated films are O doped and N doped.

20. A method according to claim 19 wherein a $N_2O$/Ar gas mix is used as a process gas.

21. A method of forming a film structure having at least a single layer magnetic film comprising a magnetic material and at least one nanolamination of a different material, the method comprising:

positioning a substrate under a first deposit target;

depositing a magnetic material from said first deposit target, wherein the magnetic material is at least about 90% of Fe, Co or Ni;

positioning the substrate under a second deposit target;

depositing a nanolamination from said second deposit target; and

performing the depositions in an environment of a reactive gas.

22. A disk drive comprising:

a magnetic disk;

a GMR head comprising the magnetic film of claim 1; and

an actuator arm for supporting the GMR head.

23. A disk drive comprising:

a magnetic disk;

a MR head; and

an actuator arm for supporting the MR head; wherein

the MR head comprises:

a magnetic alloy T-M-X wherein T is selected from the group consisting of at least about 90% Fe, Co, and Ni, M is selected from the group consisting of B, Al, Si, P, Ti, V, Cr, Cu, Ga, Ge, Zr, Nb, Mo, Ru, In, Sn, Hf, and Ta, and X is selected from the group consisting of N, O, and C; and

at least a single nanolamination of a material selected from the group consisting of $Al_2O_3$, $SiO_2$, $ZrO_2$, yttria-stabilized $ZrO_2$, $TiO_2$, $HfO_2$, $Ta_2O_5$, $Si_3N_4$, AlN, $B_4C$, SiC, $Si_4N_4$, Ta, Zr, and Hf.